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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER	
MCCARTNEY, LINZY T	

ART UNIT	PAPER NUMBER
2671	15

DATE MAILED: 07/07/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/896,148	SHIMODA ET AL.	
	Examiner	Art Unit	
	Linzy McCartney	2671	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *06 May 2004*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-18* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-18* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. Claims 1, 2, 7-10, 13, and 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Raskar et al., "Image Precision Silhouette Edges" further in view of Foley et al., "Computer Graphics: Principles and Practice" (Foley).

a. Referring to claim 1, Raskar discloses a polygon direction judging means for judging a direction of a polygon constituting a three-dimensional model, in relation to a viewpoint (page 2, column 1, paragraph 1; page 3, column 1, paragraph 6; page 4, column 1, paragraph 6) and a contour generating means for shifting vertices of a first polygon that faces a back side in relation to the viewpoint, in a direction of a normal (page 3, column 1, paragraph 6 and column 2, paragraph 2; page 4, column 1, paragraph 6), for generating a second polygon by connecting said vertices thus shifted (Fig. 2), and for painting the shifted polygon with a color that is darker than a color of the original polygon (Fig. 4). Raskar does not explicitly disclose wherein the normal for each of the vertices of the first polygon is determined as an average of normals for each of a plurality of surfaces of the first polygon that abuts the vertex. Foley discloses disclose wherein the normal for each of the vertices of the first polygon is determined as an average of normals for each of a plurality of surfaces of the first polygon that abuts the vertex (page

736, paragraph 3 – page 737, paragraph 3; Fig. 16.18). At the time the invention was made, it would have been obvious to one of ordinary skill in the art to modify the teachings of Raskar by determining the average of normals as taught by Foley. The suggestion/motivation for doing so would have been because it allows vertex normals to be approximated when they are not stored (Foley, page 736, paragraph 4).

b. Referring to claim 2, Raskar discloses generating said second polygon with a different quantity of shift for each three dimensional model (page 3, column 2, paragraphs 1 and 2).

c. Referring to claim 7, Raskar discloses judging a direction of a polygon constituting a three dimensional model in relation to a viewpoint (page 2, column 1, paragraph 1; page 3, column 1, paragraph 6); and shifting vertices of a polygon that face a back side in relation to the viewpoint, in a direction of a normal (page 3, column 1, paragraph 6 and column 2, paragraph 2; page 4, column 1, paragraph 6), generating a second polygon by connecting said vertices thus shifted (Fig. 2) and painting the second polygon with a color that is darker than color of the first polygon (Fig. 4). Raskar does not explicitly disclose wherein the normal for each of the vertices of the first polygon is determined as an average of normals for each of a plurality of surfaces of the first polygon that abuts the vertex. Foley discloses disclose wherein the normal for each of the vertices of the first polygon is determined as an average of normals for each of a plurality of surfaces of the first polygon that abuts the vertex (page 736, paragraph 3 – page 737, paragraph 3; Fig. 16.18). At the time the invention was made, it would have been obvious to one of ordinary skill in the art to modify the teachings of Raskar by determining the

average of normals as taught by Foley. The suggestion/motivation for doing so would have been because it allows vertex normals to be approximated when they are not stored (Foley, page 736, paragraph 4).

d. Referring to claim 8, Raskar discloses judging a direction of a polygon constituting a three dimensional model, in relation to a view point (page 2, column 1, paragraph 1; page 3, column 1, paragraph 6; page 4, column 1, paragraph 6); and shifting vertices of a first polygon that faces a backside in relation to the viewpoint, in a direction of a normal (page 3, column 1, paragraph 6 and column 2, paragraph 2; page 4, column 1, paragraph 6), generating a second polygon by connecting said vertices thus shifted (Fig. 2) and of painting said second polygon with a color that is darker than a color of the said first polygon (Fig. 4). Raskar does not explicitly disclose wherein the normal for each of the vertices of the first polygon is determined as an average of normals for each of a plurality of surfaces of the first polygon that abuts the vertex. Foley discloses disclose wherein the normal for each of the vertices of the first polygon is determined as an average of normals for each of a plurality of surfaces of the first polygon that abuts the vertex (page 736, paragraph 3 – page 737, paragraph 3; Fig. 16.18). At the time the invention was made, it would have been obvious to one of ordinary skill in the art to modify the teachings of Raskar by determining the average of normals as taught by Foley. The suggestion/motivation for doing so would have been because it allows vertex normals to be approximated when they are not stored (Foley, page 736, paragraph 4).

e. Referring to claim 9, Raskar discloses judging a direction of a polygon constituting a three dimensional model, in relation to a viewpoint (page 4, column 1,

paragraph 6; page 2, column 1, paragraph 1; page 3, column 1, paragraph 6); and shifting vertices of a first polygon that faces a back side in relation to the viewpoint, in a direction of a normal (page 3, column 1, paragraph 6 and column 2, paragraph 2; page 4, column 1, paragraph 6), and of painting said second polygon with a color that is darker than a color of said first polygon (Fig. 4). Raskar does not explicitly disclose wherein the normal for each of the vertices of the first polygon is determined as an average of normals for each of a plurality of surfaces of the first polygon that abuts the vertex. Foley discloses disclose wherein the normal for each of the vertices of the first polygon is determined as an average of normals for each of a plurality of surfaces of the first polygon that abuts the vertex (page 736, paragraph 3 – page 737, paragraph 3; Fig. 16.18). At the time the invention was made, it would have been obvious to one of ordinary skill in the art to modify the teachings of Raskar by determining the average of normals as taught by Foley. The suggestion/motivation for doing so would have been because it allows vertex normals to be approximated when they are not stored (Foley, page 736, paragraph 4).

f. Referring to claim 10, Raskar discloses generating said second polygon with a different quantity of shift for each three dimensional model (page 3, column 2, paragraphs 1 and 2).

g. Referring to claim 13, Raskar discloses generating said second polygon with a different quantity of shift for each three dimensional model (page 3, column 2, paragraphs 1 and 2).

h. Referring to claim 16, Raskar discloses generating said second polygon with a different quantity of shift for each three dimensional model (page 3, column 2, paragraphs 1 and 2).

3. Claims 3, 11, 14, and 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Raskar in view of Foley as applied to claims 1 and 7-9 above in view of Lake et al., "Stylized Rendering Techniques for Scalable Real-Time 3D Animation".

a. Referring to claim 3, Raskar does not explicitly disclose painting said second polygon with a different color for each three dimensional model. Lake discloses rendering silhouettes (i.e., the shifted polygons of Raskar) using a darker shade of the material color (page 17, column 2, paragraph 5). At the time the invention was made it would have been obvious to a person of ordinary skill in the art to modify the system of Raskar to color the silhouettes a darker shade of the material color as taught by Lake. The suggestion/motivation for doing so would have been because ink lines in cartoons are traditionally a darker shade of the material color (Lake, column 2, paragraph 5) and the system of Raskar is directed toward nonphotorealistic rendering applications (Abstract) such as cartoons.

b. Referring to claim 11, Raskar does not explicitly disclose painting said second polygon with a different color for each three dimensional model. Lake discloses rendering silhouettes (i.e., the shifted polygons of Raskar) using a darker shade of the material color (page 17, column 2, paragraph 5). At the time the invention was made it would have been obvious to a person of ordinary skill in the art to modify the system of Raskar to color the silhouettes a darker shade of the material color as taught by Lake. The

suggestion/motivation for doing so would have been because ink lines in cartoons are traditionally a darker shade of the material color (Lake, column 2, paragraph 5) and the system of Raskar is directed toward nonphotorealistic rendering applications (Abstract) such as cartoons.

c. Referring to claim 14, Raskar does not explicitly disclose painting said second polygon with a different color for each three dimensional model. Lake discloses rendering silhouettes (i.e., the shifted polygons of Raskar) using a darker shade of the material color (page 17, column 2, paragraph 5). At the time the invention was made it would have been obvious to a person of ordinary skill in the art to modify the system of Raskar to color the silhouettes a darker shade of the material color as taught by Lake. The suggestion/motivation for doing so would have been because ink lines in cartoons are traditionally a darker shade of the material color (Lake, column 2, paragraph 5) and the system of Raskar is directed toward nonphotorealistic rendering applications (Abstract) such as cartoons.

d. Referring to claim 17, Raskar does not explicitly disclose painting said second polygon with a different color for each three dimensional model. Lake discloses rendering silhouettes (i.e., the shifted polygons of Raskar) using a darker shade of the material color (page 17, column 2, paragraph 5). At the time the invention was made it would have been obvious to a person of ordinary skill in the art to modify the system of Raskar to color the silhouettes a darker shade of the material color as taught by Lake. The suggestion/motivation for doing so would have been because ink lines in cartoons are traditionally a darker shade of the material color (Lake, column 2, paragraph 5) and the

system of Raskar is directed toward nonphotorealistic rendering applications (Abstract) such as cartoons.

e.

2. Claims 4, 12, 15, and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Raskar in view of Foley as applied to claims 1 and 7-9 above further in view of Lake still further in view of U.S. Patent No. 6,361,438 to Morihira.

a. Referring to claim 4, Raskar does not explicitly disclose generating a second polygon with a smaller quantity of shift with a color closer to the color of the first polygon, as the three dimensional model exists more distantly from a screen. Lake discloses reducing the width of the silhouette (i.e., the "fat" shifted polygon disclosed by Raskar; note that the "fattening" is accomplished by altering the distance of the edge) with increasing distance (Lake, page 17, column 2, paragraph 5). Morihira discloses that the color of the object model is closer to the color of the original model as it distance from the screen increases (column 8, lines 4-24). At the time the invention was made it would have been obvious to one of ordinary skill in the art to modify the system Raskar by reducing the width of he silhouette as taught by Lake and having the color of the object model become closer to the original model as its distance from the screen increases as taught by Morihira. The suggestion/motivation for doing so would have been because the system of Raskar is directed to real-time nonphotorealistic rendering applications including animation (Raskar, Abstract, page 4; column 2, paragraphs 2 and 4), it would reduce the clutter of the silhouette edges (Raskar, page 4, column 2, paragraph 4) and it

would allow the polygons to be rendered in more natural colors (Morihira, column 8, lines 24).

b. Referring to claim 12, Raskar does not explicitly disclose generating a second polygon with a smaller quantity of shift with a color closer to the color of the first polygon, as the three dimensional model exists more distantly from a screen. Lake discloses reducing the width of the silhouette (i.e., the "fat" shifted polygon disclosed by Raskar; note that the "fattening" is accomplished by altering the distance of the edge) with increasing distance (Lake, page 17, column 2, paragraph 5). Morihira discloses that the color of the object model is closer to the color of the original model as it distance from the screen increases (column 8, lines 4-24). At the time the invention was made it would have been obvious to one of ordinary skill in the art to modify the system Raskar by reducing the width of he silhouette as taught by Lake and having the color of the object model become closer to the original model as its distance from the screen increases as taught by Morihira. The suggestion/motivation for doing so would have been because the system of Raskar is directed to real-time nonphotorealistic rendering applications including animation (Raskar, Abstract, page 4; column 2, paragraphs 2 and 4), it would reduce the clutter of the silhouette edges (Raskar, page 4, column 2, paragraph 4) and it would allow the polygons to be rendered in more natural colors (Morihira, column 8, lines 24).

c. Referring to claim 15, Raskar does not explicitly disclose generating a second polygon with a smaller quantity of shift with a color closer to the color of the first polygon, as the three dimensional model exists more distantly from a screen. Lake

discloses reducing the width of the silhouette (i.e., the "fat" shifted polygon disclosed by Raskar; note that the "fattening" is accomplished by altering the distance of the edge) with increasing distance (Lake, page 17, column 2, paragraph 5). Morihira discloses that the color of the object model is closer to the color of the original model as it distance from the screen increases (column 8, lines 4-24). At the time the invention was made it would have been obvious to one of ordinary skill in the art to modify the system Raskar by reducing the width of he silhouette as taught by Lake and having the color of the object model become closer to the original model as its distance from the screen increases as taught by Morihira. The suggestion/motivation for doing so would have been because the system of Raskar is directed to real-time nonphotorealistic rendering applications including animation (Raskar, Abstract, page 4; column 2, paragraphs 2 and 4), it would reduce the clutter of the silhouette edges (Raskar, page 4, column 2, paragraph 4) and it would allow the polygons to be rendered in more natural colors (Morihira, column 8, lines 24).

d. Referring to claim 18, Raskar does not explicitly disclose generating a second polygon with a smaller quantity of shift with a color closer to the color of the first polygon, as the three dimensional model exists more distantly from a screen. Lake discloses reducing the width of the silhouette (i.e., the "fat" shifted polygon disclosed by Raskar; note that the "fattening" is accomplished by altering the distance of the edge) with increasing distance (Lake, page 17, column 2, paragraph 5). Morihira discloses that the color of the object model is closer to the color of the original model as it distance from the screen increases (column 8, lines 4-24). At the time the invention was made it

would have been obvious to one of ordinary skill in the art to modify the system Raskar by reducing the width of he silhouette as taught by Lake and having the color of the object model become closer to the original model as its distance from the screen increases as taught by Morihira. The suggestion/motivation for doing so would have been because the system of Raskar is directed to real-time nonphotorealistic rendering applications including animation (Raskar, Abstract, page 4; column 2, paragraphs 2 and 4), it would reduce the clutter of the silhouette edges (Raskar, page 4, column 2, paragraph 4) and it would allow the polygons to be rendered in more natural colors (Morihira, column 8, lines 24).

3. Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Raskar in view of Foley as applied to claim 2 above further in view of Lake still further in view of Morihira.

a. Referring to claim 5, Raskar does not explicitly disclose generating a second polygon with a smaller quantity of shift with a color closer to the color of said first polygon, as the three dimensional model exists more distantly from a screen. Lake discloses reducing the width of the silhouette (i.e., the "fat" shifted polygon disclosed by Raskar; note that the "fattening" is accomplished by altering the distance of the silhouette) with increasing distance (Lake, page 17, column 2, paragraph 5). Morihira discloses that the color of the object model is closer to the color of the original model as it distance from the screen increases (column 8, liens 4-24). At the time the invention was made it would have been obvious to one of ordinary skill in the art to modify the system Raskar by reducing the width of he silhouette as taught by Lake and having the color of the object model become closer to the original model as its distance from the screen

increases as taught by Morihira. The suggestion/motivation for doing so would have been because the system of Raskar is directed to real-time nonphotorealistic rendering applications including animation (Raskar , Abstract, page 4; column 2, paragraphs 2 and 4), it would reduce the clutter of the silhouette edges (Raskar, page 4, column 2, paragraph 4) and it would allow the polygons to be rendered in more natural colors (Morihira, column 8, lines 24).

4. Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over Raskar in view of Foley further in view of Lake as applied to claim 3 above further in view of Morihira.

a. Referring to claim 6, Raskar does not explicitly disclose generating a second polygon with a smaller quantity of shift with a color closer to the color of the said first polygon, as the three dimensional model exists more distantly from a screen. Lake discloses reducing the width of the silhouette (i.e., the "fat" shifted polygon disclosed by Raskar; note that the "fattening" is accomplished by altering the distance of the silhouette) with increasing distance (Lake, page 17, column 2, paragraph 5). Morihira discloses that the color of the object model is closer to the color of the original model as it distance from the screen increases (column 8, lines 4-24). At the time the invention was made it would have been obvious to one of ordinary skill in the art to modify the system Raskar by reducing the width of he silhouette as taught by Lake and having the color of the object model become closer to the original model as its distance from the screen increases as taught by Morihira. The suggestion/motivation for doing so would have been because the system of Raskar is directed to real-time nonphotorealistic rendering applications including animation (Raskar , Abstract, page 4; column 2, paragraphs 2 and

4), it would reduce the clutter of the silhouette edges (Raskar, page 4, column 2, paragraph 4) and it would allow the polygons to be rendered in more natural colors (Morihira, column 8, lines 24).

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to **Linzy McCartney** whose telephone number is **(703) 605-0745**. The examiner can normally be reached on Mon-Friday (8:00AM-5: 30PM).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, **Mark Zimmerman**, can be reached at **(703) 305-9798**.

Any response to this action should be mailed to:

Commissioner of Patents and Trademarks

Washington, D.C. 20231

or faxed to:

(703) 872-9314 (for Technology Center 2600 only)

Hand-delivered responses should be brought to Crystal Park II, 2121 Crystal Drive, Arlington, VA, Sixth Floor (Receptionist).

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Technology Center 2600 Customer Service Office whose telephone number is (703) 306-0377.

ltm
21 June 2004

MARK ZIMMERMAN
SUPERVISORY PATENT EXAMINER
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